13.4: Discussion

Discussion

Write a minimum one-page (12 font, single spaced) discussion on the experiment conducted this week. Address **at least one question in each category** as fully as possible integrating the collected data, providing explanations for the observed trends, and evaluating whether your original assumptions about the experiment were validated by the results. **The assignment will be graded on completeness, clarity of the explanations and the meaningful integration of the collected and calculated data.** Correct grammar and appropriate format for the chemical formulae and chemical reactions is expected. **You may use the outline included at the end of this document on how to build your essay to address each category.**

1. (Existing knowledge, research, and views) Identify the main ingredient in chalk.
2. (Interpretation) Using your balanced chemical equations that describe the observed reactions, interpret their meaning of each equation on the microscopic and macroscopic scale.
3. (Representation) Starting with the molecular equations, derive the total ionic and net ionic equations for each balanced chemical equation.
4. (Interpretation) Using your balanced chemical equations and your observations, identify the limiting reactant and excess reactant in each reaction.
5. (Experiment design) Provide a supported argument for using the sodium carbonate solution to precipitate the calcium and not sodium carbonate powder. (Hint: consider the definition of a precipitation reaction for this answer.)
6. (Analysis) If you didn't have sodium carbonate available, what other compounds could you have used to precipitate the calcium ions? (Hint: consider the solubility table.)
7. (Assumptions and Limitations) Describe at least one assumption you make when calculating the amount of calcium from your chalk. Identify at least two reasons from your experiment that make it impossible to determine the exact amount of calcium in the chalk.
8. (Analysis) Compare the percent calcium of your chalks with the other groups in the class. Provide at least one argument that explains the similarity and one for the difference.
9. (Existing knowledge, research, and views) Calcium carbonate is a white powder, and yet the chalks can have a variety of colors. Describe how colored chalks are made.
10. (Existing knowledge, research, and views) Describe the difference between pigments and dyes.
11. (Analysis) Predict if adding food coloring to calcium carbonate would result in colored chalk. Provide a supported argument for your choice.
12. (Existing knowledge, research, and views) Calcium carbonate is commonly found in nature. List at least 3 materials, beyond chalk that are made of calcium carbonate. Comment on the difference in their properties despite their similar composition.